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This document comprises two studies. In the first, 108 undergraduates were assigned to nine groups of 12 subjects each in a 3 x 3 factorial design. One factor was prompt word (subject noun, main verb, or object noun) and the other was sentence type (active, passive, or relative. Sentence type was included in the study in order to vary the position of the prompt words. Each subject received two exposures for learning to a list of 12 sentences, homogeneous with respect to type, followed by an unpaced prompted recall task in which they were given either the subject nouns, the main verb, or the object nouns. None of the results of this study was found to be significant. An analysis of the procedure, however, revealed a possible confounding variable. A second experiment attempted to eliminate this variable by pacing the recall task. Forty eight subjects were assigned to four groups of 12 each in a 2 x 2 factorial design. One factor was prompt word (subject noun versus object noun) and the other was sentence type (active versus passive). Procedures were the same as for the first experiment, except that the prompted recall task was paced. The results indicated no effect of either prompt word or sentence type on sentence recall or ottal word recall. (See related document ED 016 203.) (Author/DO)

GRAMMATICAL RELATIONS AND SENTENCE RECALL

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In the first of 2 studies, 108 Ss were assigned to 9 groups of 12 Ss each in a 3 x 3 factorial design. One factor was Prompt Word (subject noun, main verb, object noun) and the other was Sentence Type (active, passive, relative). Sentence type was included in the study in order to vary the position of the prompt words. Each S received 2 exposures for learning to a list of 12 sentences, homogeneous with respect to type, followed by an unpaced prompted recall task in which they were given either the subject nouns, the main verb, or the object nouns. None of the results of this study was found to be significant. An analysis of the procedure, however, revealed a possible confounding variable.

A second experiment attempted to eliminate this variable by pacing the recall task. 48 Ss were assigned to 4 groups of 12 Ss each in a 2 x 2 factorial design. One factor was Prompt Word (subject noun vs. object noun) and the other was Sentence Type (active vs. passive). Procedures were the same as for the first experiment, except that the prompted recall task was paced. The results indicated no effect of either Prompt Word or Sentence Type on sentence recall or total word recall.

In transformational grammar, the meaning-bearing entities of a sentence are found in its deep syntactic structure. These entities are semantically interpretable lexical items and grammatical relations (e.g., subject-of-sentence, object-of-predicate phrase, main verb-of-predicate phrase). It is clear that the type of grammatical relation varies with the portion of the sentence it encompasses. For example, in the sentence, The doctor called the agent, the subject relation is one between the noun phrase the doctor and the remainder of the sentence, the object relation is one between the noun phrase the agent, and the verb called, and the main verb relation is one between the verb called and the remainder of the predicate phrase.

For the psychologist interested in verbal learning, these considerations suggest that in memorizing a sentence, the learner establishes internal associations within those portions of the sentence encompassed by each of the fundamental grammatical relations. If this is the case, and if retention is tested with a prompted recall task, then since the subject relation is the most embracing one, the subject noun should be a more efficient prompt for recall of the sentence than either the object noun or the main verb.

Blumenthal (Blumenthal, 1967; Blumenthal & Boakes, 1967) performed two studies on the role of grammatical relations in prompted sentence recall. However, Blumenthal and Boakes point out that there were some methodological problems with the first study. Hence, our discussion will be limited to the second one. In this investigation Ss were exposed to sentences of two types (e.g., John is eager to please vs. John is easy to please). In the first type John is a subject while in the second type John is an object. The task given the Ss involved (a) exposure for comprehension, (b) free recall, and (c) prompted recall, in that order. One group of Ss received the nouns as prompts, another group received the adjectives. Of interest here are the results for the noun prompts: the logical subjects were more efficient as prompts than were the logical objects.

A. Unpaced Recall

The first of two studies reported here was an attempt to test the generality of Blumenthal and Boakes' (1967) findings while using a design and procedure that differed in a number of respects from theirs. (a) In the study here reported, the grammatical function of the prompts was a between-Ss rather than a within-Ss variable; (b) verbs as well as subjects and objects were used as prompts; (c) different sentence types from those of Blumenthal and Boakes were used; (d) no comprehension and free-recall periods intervened between exposure and prompted recall; (e) recall was unpaced rather than paced, (f) presentation was visual rather than spoken, and (g) recall was written rather than oral. It was anticipated that if grammatical relations are powerful variables in recall, these changes would not produce results different from those of Blumenthal and Boakes.

Method

Design. The design of the study was a 3 x 3 factorial with Prompt Word (subject noun, main verb, object noun) as one factor, and Sentence Type (active, passive, relative, e.g., The king visited the maid, The maid was visited by the the king, It was the maid the king visited) as the other. Sentence type was manipulated so as to vary the position of the subject, main verb, and object. It is clear, however, that in the underlying structure of each of the sentences given in the example, king is marked as subject, maid as object visited as main verb.

Subjects. The Ss were 108 paid undergraduate volunteers who were assigned in rotation to the various conditions of the experiment as they appeared for testing. The Ss were used in groups of 4 to 11 persons, with a total of 12 Ss in each condition of the experiment.

Materials. Two lists of 12 sentences in the form article-animate noun-verb-article-animate noun (e.g., The king visited the maid) were constructed. Two additional lists were constructed by reversing the subject and object nouns in each sentence. The purpose was to create four different lists for each condition. The sentences in these basic lists were then transformed to produce the items for the other sentence types. The basic sentences were constructed with the assistance of associative sentence norms (Rosenberg & Koen, 1968) so as to limit the possibility of unidirectional constraints. The associative constraints within the sentence were all weak. The subjects, verbs, and objects were matched on average Thorndike and Lorge (1944) frequency and on average length (length for the verbs was determined by the infinitive). Common words were used throughout. An attempt was made to compensate for the difference in sentence length between the active sentences and the sentences of the other types by giving the Ss in each condition sentences of a single type.

The stimulus materials were printed in two booklets, a study booklet and a recall booklet. The study booklet contained two repetitions of a list of 12 sentences of the same type, one sentence to a page, separated by a

filler sheet of X's. Filler sheets appeared as the cover and as the last page of the study booklet as well. The recall booklet contained 12 lined sheets separated by filler sheets. At the top of each lined sheet was printed one of the content words from a sentence, a different word on each page. However, in any given recall booklet the prompts all had the same grammatical function.

For each S and for each presentation of a sentence list within each experimental condition, the order of sentences was different. Moreover, the order of prompts in the recall booklets varied from S to S and was different from the order in which the prompts had appeared in the study booklets.

The learning and prompted-recall instructions and the signals to turn the pages and begin the prompted recall task were recorded on magnetic tape.

Procedure. Seated in a research classroom, each S received a study booklet and a prompted recall booklet, and heard the instructions on a tape recorder. The instructions included a detailed description of the procedure to be followed in using the booklets. The Ss were told that their task was to try to learn verbatim as many of the sentences as they could. Each S received two complete exposures to his list before being tested for recall. For the prompted recall task they were told to write down on each lined page of the recall booklet as much of the sentence that contained the word printed at the top of the page as they could remember, and to try to guess at words they could not. The Ss were permitted to go through the recall booklets from beginning to end at their own rate, but were not permitted to go back to a page they had finished and were urged not to spend too much time on any one page.

Each sentence in the study booklets was exposed for 6 sec., the interval between the two exposures of a list of sentences was 6 sec., and the interval between study and recall was 12 sec.

Results and Discussion

To guard against the possibility that any effect of Prompt Word on sentence

recall might be the result of the different availability of the various parts of the sentences, free written recall data were collected beforehand with the help of lists of ten sentences constructed in the same manner as the sentences of the prompted recall study. With the exception of the recall task, the procedure was the same as that of the present study; there were 20 Ss for each of the sentence types. The results clearly indicated no effect of sentence type on recall of sentences and on total word recall, and very little over-all difference in the average recall of the subject noun and main verb, main verb and object noun, and subject noun and object noun.

The prompted recall data were scored for correct recall of sentences and of correct-word (noun and main verbs). The means for these measures can be found in Tables 1 and 2, where it can be seen that there was no general tendency for the grammatical subjects to be more efficient prompts than the main verb or objects. Indeed, there appears to be a slight surface-structure position effect. Two-way analyses of variance carried out on these data, on the basis of both Prompt Word and Position, clearly indicated no significant effect of Sentence Type, Prompt Word, or Position, and no significant interactions. No value of F even approached significance.

Insert Tables 1 & 2 about here

It might seem reasonable to conclude at this point that Blumenthal and Boakes' (1967) results are either unreplicable or at best limited to the conditions of their experiment. However, considerations of the nature of the recall task used in the present study suggests a possible confounding variable. It will be recalled that our Ss were given unlimited time to perform the prompted recall task. As a result, many of them may have adopted the strategy of trying to recall all of the sentences they could for each page of the recall booklet and recording the one that was appropriate to the prompt word on the page. If so then their task would have been converted to one of free recall.

Accordingly it was deemed advisable to repeat the experiment with a paced prompted recall task.

B. Paced Recall

In the new investigation, the Ss in the prompted recall task were paced. It was hoped that in performing their recall task the Ss would respond only to the prompt word. The present study, however, only partially replicated the previous one, since it involved only the subject and object relations and only sentences of the active and passive type. Here again, sentence type was manipulated in order to vary the position of the prompt words in the surface structure of the sentence and thus avoid confounding the effect of Prompt Word with the effect of sentence position.

Method

Design. The design of the present study was a 2 x 2 factorial with Prompt Word (subject noun vs. object noun) as one factor and Sentence Type (active vs. passive) as the other.

Subjects. The Ss were 48 undergraduate paid volunteers who were assigned in rotation to four groups of 12 Ss each. The data were collected by group testing, with the number of Ss in each session varying from seven to nine.

Materials. The present study duplicated some of the conditions of the earlier one; for these conditions, identical materials were used.

Procedure. In all respects except one, the procedure was identical with the procedure used in the previous study. The difference lay in the prompted recall task. In the present study, Ss were given 20 sec. to respond to each of the prompt words in a continuously paced recall task. Preliminary research indicated that 20 sec. was just enough time for most Ss to read the prompt word and write down the appropriate sentence before receiving instructions to turn the page to the next prompt word.

Results and Discussion

The prompted recall data were again scored for correct sentence recall and content-word (subject and object nouns) recall. The means for these measures can be found in Table 3; it is apparent that neither the grammatical

function of the prompt nor its position has contributed to recall. To be sure, the recall scores for the passive sentences were higher, on the average, than those for the active sentences. Nevertheless, analysis of variance revealed no significant results for any of the comparisons of the experiment.

Insert Table 3 about here

Even after a possible confounding variable in the procedure of the previous study has been eliminated, there is no evidence for the hypothesis that the logical subject of a sentence is a more efficient prompt for recall of the sentence than the logical object. This hypothesis, it will be recalled, was derived from the assumption in transformational grammar that the subject-of relation encompasses more of a sentence than do relations such as object-of. We can only conclude from these findings that Blumenthal and Boake's (1967) results are either unreliable or limited to the conditions of their experiment.

References

Blumenthal, A. L. Prompted recall of sentences. Journal of Verbal Learning and Verbal Behavior, 1967, 6, 203-206.

Blumenthal, A. L., & Boakes, R. Prompted recall of sentences. Journal of Verbal Learning and Verbal Behavior, 1967, 6, 674-676.

Rosenberg, S., & Koen, M. Norms of sequential associative dependencies in active declarative sentences. In J. C. Catford (Ed.), Studies in language and language behavior, Supplenent to progress report VI. Ann Arbor: University of Michigan, Center for Research on Language and Language Behavior, U. S. O. E. Contract OEC-3-6-061784-0508, February 1, 1968.

Thorndike, E. L., & Lorge, I. The teacher's word book of 30,000 words. New York: Columbia University, Teachers' College, 1944.

Table 1

Mean Sentence Recall On Unpaced Recall Test

Sentence Type	Prompt Word: Subject	Main Verb	Object
Active	6.50	5.67	5.83
Passive	4.58	5.67	5.83
Relative	5.08	4.92	5.42

Table 2

Mean Content-Word Recall On Unpaced Recall Test

Sentence Type	Prompt Word: Subject	Main Verb	Object
Active	15.50	13.08	14.33
Passive	11.83	12.83	14.33
Relative	12.92	11.00	13.33

Table 3

Mean Sentence and Content-Word Recall On Paced Recall Test

	Prompt Word: Sentences	Words	Sentences	Words
Sentence Type				
Active	5.41	12.25	5.25	12.08
Passive	6.58	15.50	6.67	14.67